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IS 13109-7 (1991): electronic equipment/systems for use in coal and metalliferrous mines, Part 7: Requirement for cage communication systems [LITD 8: Electronic Measuring Instruments, Systems and Accessories]

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भाग 7 केज संचार तंत्र की अपेक्षाएं

Indian Standard

SPECIFICATION FOR ELECTRONIC EQUIPMENT/SYSTEMS FOR USE IN COAL AND METALLIFERROUS MINES

PART 7 REQUIREMENTS FOR CAGE COMMUNICATION SYSTEMS

UDC 622·489 : 621·39

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

June 1991 **Price Group 1**

Mining Electronics Sectional Committee, LTD 32

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Mining Electronics Sectional Committee had been approved by the Electronics and Telecommunication Division Council.

This standard (Part 7) is part of a series of standards on 'Specification for electronic equipment/ systems for use in coal and metalliferrous mines'.

For the purpose of deciding whether a particular requirement of the standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

SPECIFICATION FOR ELECTRONIC EQUIPMENT/SYSTEMS FOR USE IN COAL AND METALLIFERROUS MINES

PART 7 REQUIREMENTS FOR CAGE COMMUNICATION SYSTEMS

1 SCOPE

1.1 This standard covers the requirements and tests for cage communication systems for use in coal and metalliferrous mines.

1.2 This standard shall be read in conjunction with IS 13109 (Part 1) : 1991.

2 REFERENCES

The following Indian Standard is a necessary adjunct to this standard.

IS No.	*Title*
13109 (Part 1) : 1991	Specification for electronic equipment/systems for use in coal and metalliferrous mines: Part 1 Definitions, general requirements and tests

3 TERMINOLOGY

Provisions of **3** of IS 13109 (Part 1) : 1991 shall apply.

4 GENERAL REQUIREMENTS

4.1 Provisions of **5** of IS 13109 (Part 1) : 1991 shall apply. For the purpose of protection class (IP) in **5.3** of IS 13109 (Part 1) : 1991, this system shall be considered as a non-safety system.

4.2 Each cage communication system shall provide communication between cage crew on one side and engine driver, banksman, onsetter at the other side. In addition the cage crew may also be able to communicate with other personnel.

4.3 During communication, either the winding rope or cage guide or any special conductor suspended in the shaft may act as the coupling loop.

4.4 Each system may also have signalling facilities for raising, lowering and stopping the cage. In addition, other communication facilities may be provided as agreed between purchaser and manufacturer.

4.5 The system shall operate satisfactorily over a depth of 600 m (minimum) from the surface level.

5 SAFETY REQUIREMENTS

5.1 Provisions of **6** of IS 13109 (Part 1) : 1991 shall apply.

6 FUNCTIONAL REQUIREMENTS

6.1 The functional requirements shall be as follows:

a) R. F. Parameters:

Speech and/or data

  i) Modulation-FM and/or PM
  ii) Carrier frequency-10 KHz to 100 KHz.

b) Audio Parameters:

  i) Received speech frequency response : Within 0 and −8·7 dB over a frequency range of 300 Hz and 3·4 KHz or better, measured with respect to 800 Hz.
  ii) Maximum allowable distortion : 5 percent
  iii) Cross Talk : i) Between 2 circuits—58 dB.
    ii) Between go and return direction of a circuit — 43 dB.
  iv) Power Supply : Provisions of **5.7** of IS 13109 (Part 1) : 1991 shall apply.

c) Effective Transmission range : Minimum 2 Km.

6.2 Any additional requirements may also be specified as agreed between purchaser and manufacturer.

7 MARKING

7.1 Provisions of **8** of IS 13109 (Part 1) : 1991 shall apply.

7.2 The type of coupling loop to be used with the equipment shall also be marked. The cable distributed parameters shall be supplied by the manufacturer.

8 ENVIRONMENTAL REQUIREMENTS

8.1 Provisions of **9** of IS 13109 (Part 1) : 1991 shall apply.

8.2 Endurance Test

The sample shall be energised by the test voice signal (for example, a recorded speech) of two minutes duration and then disabled. 1000 such operations shall be carried out and duration between two successive operations shall be 10 seconds. Recovery period shall be 1 hour.

8.2.1 All mating parts, which are required to be engaged/disengaged for normal operation of the equipment/systems, shall be engaged/disengaged 500 times under deenergised condition at the rate of 6 to 10 operations per minute. There shall not be any mechanical damage after this test.

9 GENERAL CONDITIONS FOR MEASUREMENTS

9.1 Provisions of **11** of IS 13109 (Part 1) : 1991 shall apply.

10 TESTS

10.1 Classification of Tests

10.1.1 *Type tests*

10.1.1.1 Provisions of **10.1.1** of IS 13109 (Part 1) : 1991 shall apply.

10.1.1.2 After each type test, the sample shall be subjected to functional requirements as specified in **6** of this standard.

10.1.2 *Routine Test*

The following shall constitute routine tests.

a) Visual examination.

b) Received speech frequency response.

c) Range.

d) Maximum allowable distortion.

e) Cross talk.

f) Power supply check.

10.1.3 *Acceptance Tests*

10.1.3.1 Provisions of **10.1.3** of IS 13109 (Part 1) : 1991 shall apply.

10.1.3.2 The following tests shall constitute the acceptance tests:

a) Visual examination.

b) Received speech frequency response.

c) Range.

d) Maximum allowable distortion.

e) Cross talk.

f) Power supply check.

g) Protection against ingress of solid foreign bodies and liquid particles.

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